

### **REMARKS/ARGUMENTS**

This Amendment follows the final Office Action and Advisory Action mailed October 3, 2003, in the above-referenced application. Applicants note with appreciation entry of the claim amendments presented in the Amendment after Final mailed September 3, 2003, and the withdrawal of the rejection under 35 USC Section 112, 2d paragraph, labeled F) and G) at page 2 of the final Office Action. Claims 1-12, 14-15 and 26 are pending. Claim 13 is cancelled and the subject matter thereof is incorporated into Claims 11 and 26.

Claims 1-16 and 26 are rejected under 35 USC § 112, second paragraph, as indefinite. Applicants offer the following comments.

Paragraph A) on page 2 of the final Office Action states that chemical reactions should be set forth in the process claims. Applicant believes the claims recite sufficient information regarding the chemical reactions involved in the process. However, to advance prosecution of this matter, Claim 1 is amended to recite the chemical reactions of the process. Claim 1 is further amended to clarify the various steps of the methods, reciting a step of measuring total titratable alkali (TTA) of the green liquor, providing a model that relates green liquor density to the measured TTA, determining green liquor density based on the model, and controlling density of the green liquor accordingly.

In paragraph B), the Office argues that the term "a production curve" in Claim 10 is unclear. Applicant directs the Examiner's attention to page 12, lines 18-23 and Figure 7 of the specification, which clearly define this term.

In paragraph C) the Office argues that the term "dynamic" in Claim 7 is unclear. Again, Applicant respectfully submits that the term "dynamic" is definite in view of the teachings of the specification, for example, at page 11, line 19, through page 12, line 6.

In paragraph D) the Office argues that Claim 8 seems to state that if the temperature is too high, then the temperature is changed so it is also too high. Applicant respectfully disagrees with this interpretation of Claim 8. Claim 8 states that the lime to green liquor ratio is controlled using a temperature difference control. When the measured temperature deviates from the

temperature target, the lime to green liquor ratio target is changed in the opposite direction. Applicant does not understand the Examiner's argument because Claim 8 specifically recites modifying a lime to green liquor ratio target in the opposite direction of the measured temperature, and not increasing the temperature when the measured temperature is too high.

In paragraph E) the Office argues that the term "model" is unclear with respect to how the model works and how values are calculated. Both independent Claims 1 and 26 recite measuring the total titratable alkali in the green liquor. As discussed above, the invention correlates the measured total titratable alkali of a green liquor stream to the density of the green liquor stream. With this value in hand, the operator can then readily adjust the green liquor density as necessary, for example, by introducing white liquor into the green liquor stream as recited in Claim 26.

One skilled in the art would understand the mathematics involved in this calculation based upon the chemistry of the causticizing process. The skilled artisan could therefore readily determine the relationship between TTA and density of the green liquor stream and implement any adjustments necessary to the green liquor stream to provide the desired downstream product. The nexus, i.e. the mathematic relationship, between the density and the TTA is also clearly defined within the application as filed, for example on page 9, line 31 through page 10, line 9. This correlation can be readily calculated manually or using a computer program. In either instance, the skilled artisan would understand the "model" or calculations that correlate these values. Applicant notes that the invention is not just the application of a mental model or mathematical algorithm because the claims also recite a specific process step to modify a reagent stream in response to this calculation, therefore resulting in a useful, concrete and tangible result.

Applicant accordingly respectfully submits that the claimed invention is definite and requests withdrawal of this rejection.

Claims 1-16 and 26 are rejected under 35 USC § 112, first paragraph, as containing subject matter which does not meet the written description requirement. Applicant offers the following comments.

As a preliminary matter, Applicant respectfully notes that the Office does not set forth specific objections to Claim 26. Rather, the Office's comments are directed to Claims 1 and 11. Accordingly Applicant submits that the written description rejection of Claim 26 must be withdrawn.

The Office objects to the term "coefficient" in Claim 11. Applicant respectfully submits that the specification does describe how to calculate this value and how to determine when the model/target is wrong. However, again to advance prosecution of this matter, Claims 11 and 26 are amended to incorporate the subject matter of Claim 13, which recites the coefficient value when the unit used for expressing the TTA and the density are the same.

Applicant submits that Claim 1 is also adequately described in the specification. Claim 1, however, is amended to incorporate the subject matter of Claim 16 to advance prosecution. Claim 1 now includes the step of measuring TTA in the green liquor.

Claim 1 correctly recites a "controlling" step, and not a "calculating" step. The operator can control (or modify) the density of the green liquor stream as necessary to provide the desired end product, i.e., make any necessary adjustments to the inlet stream so as provide the desired density. The invention is not just the application of a mental model or mathematical algorithm because the claims also recite a specific process step in which the a reagent stream is controlled or modified as necessary in response to this calculation, therefore resulting in a useful, concrete and tangible result. The claimed invention does not mere calculate the density of the green liquor but controls the density as needed in response to TTA measurements.

Applicant accordingly respectfully requests withdrawal of this rejection as well.

Claims 1-16 and 26 are rejected under 35 USC § 103 as unpatentable over Baines taken with Mosow. Applicant respectfully traverses this rejection.

The Office relies upon Baines as teaching computer control of a causticizing process. Baines states that there are two categories of measurements made of the liquors and the process described therein, namely, "ambient measurements" and "liquor component measurements." Page 8, lines 13-16. The ambient measurements include temperature, pressure, pH, flow rate, and density of the liquor as it is processed through the slaker and causticizers. The liquor component measurements include the relative concentrations of the primary components (NaOH,

Na<sub>2</sub>CO<sub>3</sub> and Na<sub>2</sub>S) of the green and white liquors. Thus Baines measures different characteristics of the liquor streams than the claimed invention. Indeed, Baines nowhere teaches or suggests measuring total titratable alkali and using this measurement as a basis for controlling the causticizing process.

Baines also differs from the claimed invention with regard to the approach used to obtain measurements of the various parameters of the process streams. In particular, Baines relies upon measurements made using a polarographic process, based on the electrical conductivity induced over a voltage spectrum. The claimed invention does not rely upon conductivity measurements to determine the total titratable alkali within the green liquor inlet stream. Thus, not only does Baines measure different components of the various streams in the causticizing process, as compared to the claimed invention, Baines relies upon a different measurement than that as claimed.

Indeed, Baines actually teaches away from the claimed invention. Baines states that determining the relative concentrations of the liquor components, as opposed to a measurement of a characteristic of the total liquor, is critical to the successful implementation of the invention. Page 8, lines 30-32. Thus Baines teaches away from relying upon a measurement of a characteristic of the total liquor, such as total titratable alkali used in the claimed invention. Baines instead relies upon measurements of a plurality of different parameters of the liquor streams. Thus, Baines differs significantly with respect to the approach taken to control the causticizing process as compared to the claimed invention.

Mosow does not overcome the deficiencies of Baines. Mosow also relies upon conductivity measurements to determine concentrations of a component of a stream during a causticizing process, in particular to determine sodium carbonate concentration. Further, Mosow actually teaches away from the claimed invention, stating that the method described therein is more accurate than indirect measures such as that of the density or total titratable alkali in a green liquor. Column 2, lines 58-62.

Neither of the cited references, whether considered singly or in combination, teach or suggest the claimed invention. Both of the cited references are directed to techniques utilizing conductivity measurements to control a causticizing process. In contrast, the claimed invention

does not rely upon conductivity measurements. Further, both of the cited references rely upon measurements of different stream components than that in the present invention. Neither reference teaches or suggests controlling a causticizing process by measuring total titratable alkali within a green liquor inlet stream and adjusting the density of the green liquor inlet stream based upon this measurement.

Indeed, the cited references teach away from the claimed invention. Baines teaches that determining the relative concentrations of a number of different green and white liquor components is required, as opposed to a measurement of a characteristic of the total liquor. Mosow specifically teaches away from the use of either density or total titratable alkali.

Accordingly, there is no motivation to combine the references as suggested by the Examiner. Even if the teachings of the references were combined, the result would not be the same as that claimed, because the references measure different stream components in an entirely different manner than claimed. Indeed, the references actually teach away from the claimed invention. Applicant accordingly respectfully requests withdrawal of this rejection as well.

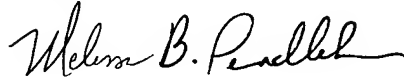
The rejections of record having been addressed in full in the foregoing, Applicant respectfully submits that this application is now in condition for allowance, which action is respectfully solicited. Should the Examiner have any questions regarding the foregoing, it is respectfully requested that he contact the undersigned at his convenience.

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It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required

therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

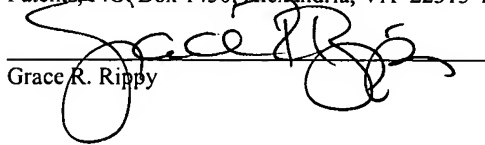


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Grace R. Rippy